

Background

The Spokane Valley–Rathdrum Prairie (SVRP) aquifer is the sole source of drinking water for more than 400,000 residents in Spokane County, Washington, and Kootenai County, Idaho. The area includes the rapidly growing cities of Spokane, Spokane Valley, and Liberty Lake, Washington; and Coeur d’Alene and Post Falls, Idaho. Recent and projected urban, suburban, and industrial/commercial growth has raised concerns about potential future impacts on water availability and water quality in the SVRP aquifer, and Spokane and Little Spokane Rivers. The aquifer is highly productive, consisting primarily of thick layers of coarse-grained sediments – gravels, cobbles, and boulders – deposited during a series of outburst floods resulting from repeated collapse of the ice dam that impounded ancient glacial Lake Missoula.

The Washington State Department of Ecology, Idaho Department of Water Resources, and the U.S. Geological Survey are conducting a joint investigation of the aquifer to develop a comprehensive data set that will provide an improved scientific basis for ground- and surface-water management. The study will include the construction of a numerical ground-water model to support the conjunctive management of ground- and surface-water resources. Application of the numerical model to water-resource management strategies will occur as a cooperative effort by Washington and Idaho water-resource managers.

Landowners and local municipalities are an integral part of this investigation. They are gratefully acknowledged for granting permission to access their property for data collection. Without their consent, it would be impossible to collect the majority of the data required for this study.

Objectives

The purpose of this study is to gain a better understanding of ground- and surface-water resources in the SVRP area.

This study will provide:

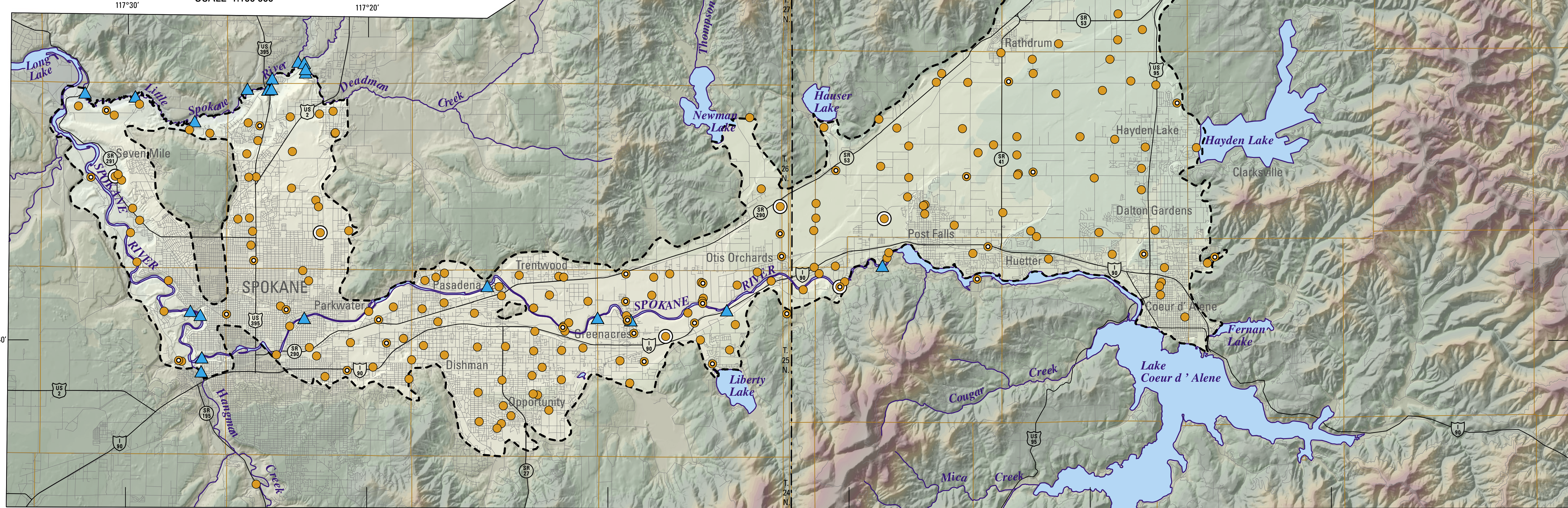
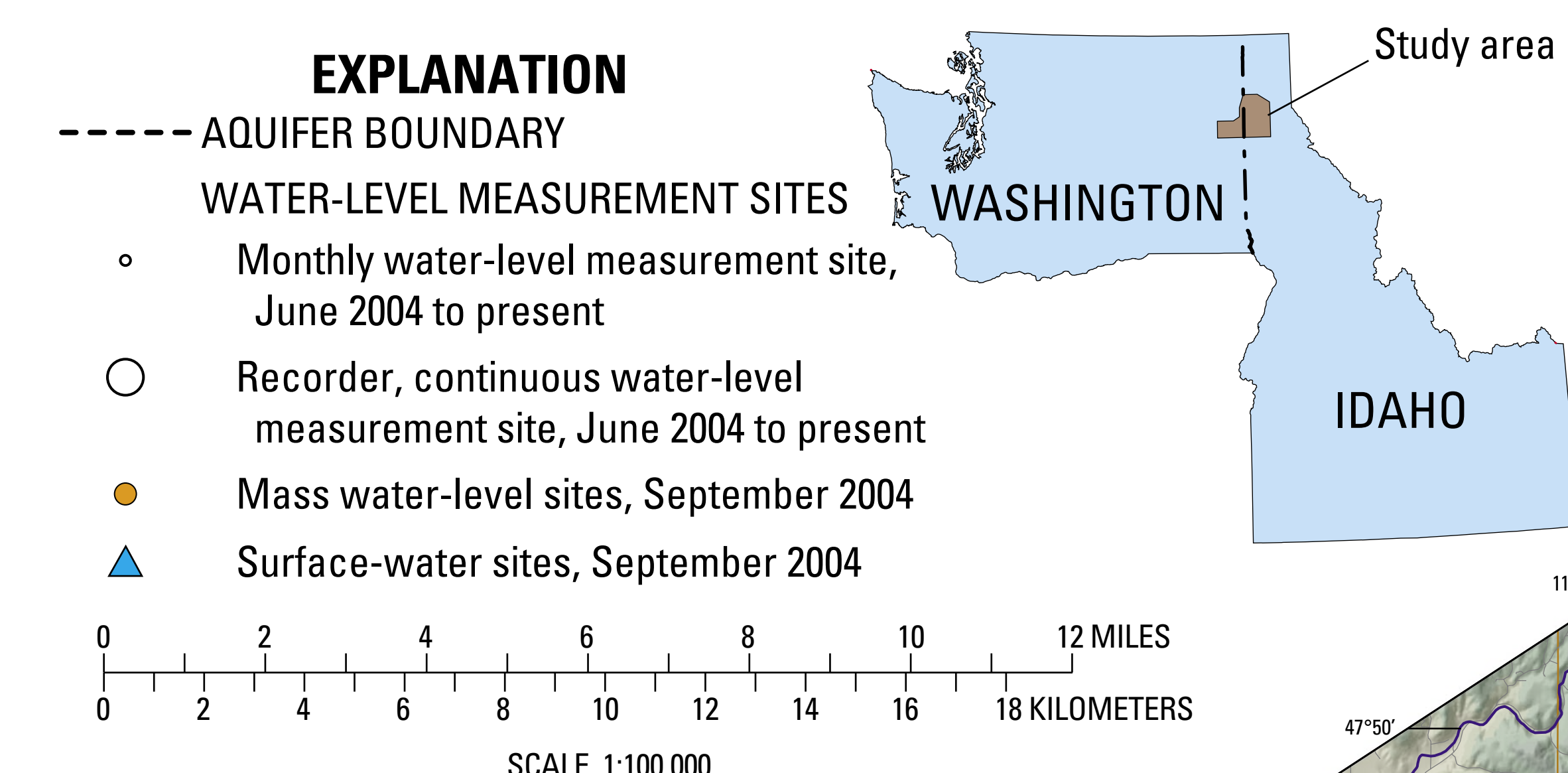
- An improved scientific basis for evaluating water-management alternatives for the SVRP aquifer and Spokane and Little Spokane Rivers.
- The means for estimating the effects of additional ground- and surface-water withdrawals from the SVRP aquifer and Spokane and Little Spokane Rivers, as well as simulating potential effects of climate change on water resources in the area.

The study includes:

- Compile, review, and evaluate published reports, numerical models, and database records describing geology, hydrogeology, aquifer characteristics, and water-budget components of the SVRP aquifer, and adjacent geologic units.
- Establish monitoring networks and collect ground-water level and stream- discharge data to characterize the movement of water in the SVRP aquifer and the exchange of water between the aquifer and adjacent rivers and lakes.
- Collect additional data for improved understanding of the physical extent and hydraulic properties of the aquifer and the aquifer water budget (recharge and discharge).
- Construct a numerical ground-water model to support the management of ground- and surface-water resources in the SVRP area.
- Convey project results to Federal, State and local decisionmakers, the professional community, and the general public.



Spokane River, looking upstream to the Sullivan Road bridge Photograph by USGS Personnel, 2002



MAP SHOWING GROUND-WATER AND SURFACE-WATER MEASUREMENT SITES, SPOKANE VALLEY-RATHDRUM PRAIRIE AQUIFER, WASHINGTON AND IDAHO, 2004

Progress highlights as of January 2005

- An observation network of more than 50 wells for monthly water-level measurements and another 8 wells with continuous electronic recorders has been in operation since June 2004. These data will provide information on seasonal fluctuations and long-term trends of water levels in the aquifer.
- A mass water-level measurement was conducted in September 2004. This measurement, a “snapshot” of ground-water levels in the aquifer, included the observation network and an additional 200 wells aquifer-wide. Data from the mass measurement will be used to expand the understanding of water movement in the aquifer.
- Streamflows were measured at 20 locations along the Spokane and Little Spokane Rivers, and selected tributary creeks and springs in September 2004 coinciding with the mass water-level measurement. These measurements will be used to better understand the exchange of water between the aquifer and surface-water system.
- With assistance from Spokane County, all measurement sites have been surveyed using Digital Global Positional System technology to assure three-dimensional accuracy.
- An annotated bibliography, representing available information regarding the SVRP aquifer geology and hydrogeology was assembled. The bibliography will be continually updated with new information.
- The Modeling Team, comprised of one representative from each participating agency is compiling existing models and information, refining the conceptual model of the aquifer, and providing direction on data needs for the current workplan.
- Current project activities focus on refining our understanding of recharge to and discharge from the aquifer, compiling and expanding our understanding of the hydrogeologic properties of the aquifer, and more closely understanding the physical conditions within and bounding the aquifer. Data gathered will apply directly to model development.



Photograph by Sue Kahle, USGS, 2004



Photograph by Sandra Ball, USGS, 2004



Photograph by Keith Hein, USGS, 2004



Photograph by Guy Gregory, WDOE, 2004



Photograph by Sabrina Conti, USGS, 2004



Photograph by Ed Hagan, IDWR, 2004

Scientists from the Washington State Department of Ecology, Idaho Department of Water Resources, and the U.S. Geological Survey recording water-level measurements, September 2004

Spokane Valley–Rathdrum Prairie Hydrologic Study
For additional information:
<http://www.idwr.state.id.us/hydrologic/projects/svvp>
<http://www.water.usgs.gov/projects/svvp>